REMARKS

STATUS OF THE CLAIMS

Claims 3-19 are pending in the application.

Claims 3-15 and 18-19 are rejected under 35 USC 103(a) as being unpatentable over Yamashita (U.S. Patent No. 5,555,362) in view of Ohsawa (U.S. Patent No. 4,876,610), Wada (U.S. Patent No. 5,949,922), and Edgar (U.S. Patent No. 5,266,805).

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita (U.S. Patent No. 5,555,362) in view of Ohsawa (U.S. Patent No. 4,876,610), Wada (U.S. Patent No. 5,949,922), Edgar (U.S. Patent No. 5,266,805), and Graham (U.S. Patent No. 5,222,154).

According to the foregoing the claim 5 is amended for clarity, and, thus, claims 3-19 remain pending for reconsideration, which is respectfully requested.

No new matter has been added.

A final Office Action was mailed on July 11, 2005 setting a period for response due on October 11, 2005. An After Final Response was filed on November 14, 2005 (November 11, 2005 falling on a Federal Holiday). An Advisory Action was mailed November 29, 2005 in response to the After Final Response filed November 14, 2005. The following remarks are submitted in response to the Advisory Action Response to Arguments. A Request for Continued Examination (RCE) is filed concurrently herewith along with a Petition for a 2-month extension of time, together with the requisite fee for same, thereby extending the period for response to December 12, 2005 (December 11, 2005 falling on a Sunday). Entry of the RCE and this Response and consideration of the remarks herein as well as reconsideration of the remarks in the After Final Response filed on November 14, 2005 is respectfully requested, because the remarks herein clarify the patentably distinguishing features of the claimed present invention in view of the Advisory Action remarks.

REJECTIONS

The Advisory Action Response to Arguments is traversed, as follows.

In the Advisory Action, page 2, the Examiner asserts "Ohsawa teaches that the average halftone density is calculated in a given area defined by a central pixel and surrounding pixels."

This appears to be based upon Ohsawa's column 4, lines 35-54. Then, the Examiner asserts, "Wada teaches calculating center-of-gravity information about centers of gravity of halftone dots as information about each halftone dot in the area of an image." This appears to be based upon Wada's Position Error Measurement Operation in column 12. Then, the Examiner asserts, "Thus, by combination, the calculations involving the central pixel taught by Ohsawa are performed in the manner set forth in Wada." It is believed the Examiner alleges Ohsawa's halftone density calculation would involve calculating center-of-gravity information. In other words, the Examiner appears to allege that Ohsawa's average density calculation is based upon center-of-gravity information to meet the claimed present invention's, ***"calculating a halftone dot density in a given area by referring to the center-of-gravity information*** in the list of halftone dot information." Otherwise, Applicants request clarification of the remark, "Thus, by combination, the calculations involving the central pixel taught by Ohsawa are performed in the manner set forth in Wada."

However, Ohsawa does not discuss calculating the halftone density based upon center-of-gravity information. Ohsawa does not expressly discuss how the "Average calculation unit 51, calculates the average density of the central pixel 50e and the surrounding pixels 50a, 50b, 50c, 50d, 50f, 50g, 50h, and 50i ..." (column 4, lines 35-42). Wada, which discusses calculating center-of-gravity information about centers of gravity of halftone dots as part of Position Error Measurement Operation, fails also to provide a motivation to be combined with Ohsawa's halftone density calculation, or in other words, a combination of Ohsawa and Wada fails to disclose or suggest the claimed present invention's, ***"calculating a halftone dot density in a given area by referring to the center-of-gravity information*** in the list of halftone dot information," because Wada uses the center-of-gravity information of pixels as part of "Position Error Measurement Operation" during image reading, but not to perform the claimed present invention's ***"eliminating an erroneously recognized halftone dot."***

In the Advisory Action, page 3, the Examiner alleges, "The motivation to combine is that the center-of-gravity information and basing measurements, such as density, on the center-of-gravity reduces the overall noise in the image (column 14, lines 34-42 of Wada)." However, nowhere in Wada, including column 14, lines 34-42 of Wada, there is a discussion of ***"halftone dot density."*** The expression "density" does not appear in Wada, undermining any basis for obviousness motivation or Wada cannot provide any suggestion to be combined with and to modify Ohsawa.

Regarding Edgar, in the Advisory Action, page 3, the Examiner alleges, "Edgar teaches calculating a halftone dot density" in column 5, lines 63-67. However, Edgar in column 5, lines 63-67 provides, "In according with the invention, a mechanism such as a color wheel or the like (shown conceptually as a prism) will be employed to separate the information comprising the image 14 and imperfections 16 into a plurality of individual records, each associated with a different portion of the electromagnetic spectrum," but does not discuss calculating a halftone dot density. Edgar in column 13, lines 30-35, discusses also, "Large imperfections on the other hand may be masked by an algorithm which duplicates texture as well as density across the defect such as a fractal generator. However, employing such a technique may be desirable only in the case of extremely large defects." Therefore, Edgar does not mention the claimed present invention's "***calculating a halftone dot density in a given area by referring to the center-of-gravity information*** in the list of halftone dot information."

Further, the Examiner does not substantively respond to arguments in the After Final Response of November 14, 2005, in response to Final Office Action, page 9 rejection, that Edgar does not disclose or suggest the claimed present invention's, "***binarizes an input image*** ..., while ***suppressing input read errors*** occurred when said input unit inputs the binary image ***by optimizing a value of a target pixel to be binarized***, and generates a binarized halftone dot image." It is readily apparent that Edgar fails also to disclose or suggest, "***optimizing a value of a target pixel to be binarized.***"

Accordingly, in view of the remarks, it is respectfully submitted a prima facie case of obviousness of independent claims 3, 18 and 19 cannot be established based upon a combination of Yamashita, Ohsawa, Wada, and Edgar as discussed herein as well as in the After Final Response of November 14, 2005 (reconsideration of which is also requested). Withdrawal of the rejection of independent claims 3, 18 and 19 and allowance of the present application is respectfully requested.

DEPENDENT CLAIMS 4-6

Further, dependent claims recite patentably distinguishing features of their own and/or are at least patentably distinguishing over the relied upon references due to their dependency(ies) from the independent claims.

For example, in contrast to Yamashita, Ohsawa, Wada and Edgar, dependent claim 4 provides, "wherein said halftone dot image area map creating unit ***calculates a halftone dot density in one of blocks that correspond to a given area*** by referring to the center-of-gravity

information about halftone dots in said one of the blocks and deletes corresponding information from the halftone dot image area map when the halftone dot density does not meet a given condition." In other words, according to claim 4 discussed in page 13, lines 5-12 and FIG. 4 of the present Application, "the centers of gravity of halftone dots are grouped into blocks of a predetermined size, and the process of determining whether each block includes an erroneously recognized halftone dot is performed. ... this variation employs block-based process, not the dot-based process." The final Office Action in page 10 relies on Yamashita, column 4 and FIG. 3, which discusses area segmentation of a document image into rectangular areas shown in FIG. 3 (column 4, lines 11-67). However, Yamashita fails to disclose or suggest, "***calculates a halftone dot density in one of blocks that correspond to a given area***," because Yamashita's discusses area segmentation, "According to known black component labeling method and run-length combining method ..." (column 4, lines 18-22) and "The image area can be separated from the character area by using a characteristic value such as the neighborhood line density as reported in the existing method" (column 4, lines 64-67). So, Yamashita fails to disclose or suggest the claimed present invention's, "***calculates a halftone dot density in one of blocks that correspond to a given area,***" to provide a block-based erroneous halftone dot elimination process.

Further, dependent claim 5 is amended for clarity. Support for dependent claim 5 and amendments can be found, for example, in page 13, starting at line 13, and FIGS. 5 and 6 of the present Application. In contrast to Yamashita, Ohsawa, Wada and Edgar, dependent claim 5 provides, "said ***creating the halftone dot image area map*** by the halftone dot image area map creating unit comprises performing ~~performs a~~ ***first process of painting out a boundary box and a second process of painting out a portion expanding from the boundary box on the basis of the boundary box information, for each of all the center-of-gravity information,*** to create the halftone dot image area map, and includes the boundary box and the portion that have been painted out ~~being included~~ in the binarized halftone dot image." The final Office Action in page 10 asserts, "The image (figure 3 of Yamashita) is separated into a plurality of boundary boxes, which are stored in memory (column 4, lines 13-18 of Yamashita). The image data type of each bounded region is determined to be either character data or image data (column 4, lines 59-64 of Yamashita). The image are would necessarily be a halftone dot image area since images are printed as a collection of halftone dots." However, it is readily apparent that Yamashita's separating the image into a plurality of boundary boxes into character data or image data, differs from the claimed present invention's, "said ***creating the halftone dot image***

area map by the halftone dot image area map creating unit comprises performing ~~performs~~ a ***first process of painting out a boundary box and a second process of painting out a portion expanding from the boundary box on the basis of the boundary box information, for each of all the center-of-gravity information,*** ..." In other words, Yamashita fails to disclose or suggest "***a first process*** ... and ***a second process*** ... ***on the basis of boundary box information, for each of all the center-of-gravity information***."

Similarly, dependent claim 6 depending from claim 5 is patentably distinguishing over Yamashita and Ohsawa. The final Office Action, page 11 relies on Ohsawa by alleging "Ohsawa discloses that varying sizes of matrices are used to define the boundary boxes (column 5, lines 5-10 of Ohsawa) ... so there is an inherent overlap between boundary boxes in the image area map." However, the Office Action allegation of "an inherent overlap between boundary boxes" clearly differs and contrary to claims 5 and 6 recitations, "***a first process*** ... and ***a second process*** ... ***on the basis of boundary box information, for each of all the center-of-gravity information***" and "***when a gap pixel*** remains after the first and second processes are performed for each of all the center-of-gravity information, ***said halftone dot image area map creating unit paints out the gap pixel when a number of gap pixels is smaller than a predetermined threshold value***," as shown in FIG. 6 of the present Application. Further, Ohsawa discusses "The first binary digitizing circuit 14 executes binary digitization by an error dispersion method in which the error is dispersed with a relatively large matrix," but Ohsawa's pixel matrices for error dispersing or error dispersing matrices differ from the claimed present invention's, "said ***creating the halftone dot image area map*** by the halftone dot image area map creating unit comprises performing ~~performs~~ a ***first process of painting out a boundary box and a second process of painting out a portion expanding from the boundary box on the basis of the boundary box information, for each of all the center-of-gravity information***, because both Yamashita and Ohsawa do not disclose or suggest "***painting out a boundary box ... and ... painting out a portion expanding from the boundary box*** ... ***for each of all the center-of-gravity information***," as illustrated in FIG. 6 of the present Application.

DEPENDENT CLAIMS 8-15

Further, in contrast to Yamashita, Ohsawa, Wada and Edgar, independent claim 1 provides, "***binarizes an input image*** ..., while ***suppressing input read errors*** occurred when said input unit inputs the binary image ***by optimizing a value of a target pixel to be binarized***,

and generates a binarized halftone dot image." It is readily apparent that Yamashita, Ohsawa, Wada and Edgar fail to disclose or suggest, "***optimizing a value of a target pixel to be binarized.***" As discussed above, it is readily apparent that Yamashita, Wada and Edgar do not discuss the claimed present invention's, "***optimizing a value of a target pixel to be binarized,***" so it appears by rejecting dependent claims 8-15 the Office Action relies on Ohsawa's error dispersion method. However, Ohsawa's error dispersion method is based upon a difference between a corrected signal added immediately before the currently processed signal and the binary digitized output signal y_{ij}, so that "***a target pixel to be binarized***" is not ***optimized*** to suppress errors by Ohsawa, but Ohasawa disperses an error "so that each error e_{ij} in the error buffer memory 60 is displaced to the right by one pixel" (column 7, lines 60-64).

For example, dependent claim 8 provides, "wherein said halftone dot image binarizing unit ***sets a proximity area close to a target pixel*** that is included in the input image corresponding to the halftone dot image area map and is to be binarized."

And dependent claim 9 depending from dependent claim 8 provides, " said halftone dot image binarizing unit ***adaptively determines a threshold value for binarization*** on the basis of a distribution of pixel values in the halftone dot image area."

And dependent claim 10 depending from claim 8 provides, "wherein said halftone dot image binarizing unit ***changes*** a value of the target pixel ***on the basis of the distribution***, a changed value of the target pixel being used for binarization."

And dependent claim 11 depending from claim 10 provides, "wherein, when said halftone dot image binarizing unit ***detects an inclination in regard of pixel values on the basis of distribution thereof***, the halftone dot image binarizing unit ***does not binarize the target pixel in the absence of change of the value thereof.***"

See also, dependent claims 12-15.

The final Office Action in rejecting dependent claims 8-15 relies on Ohsawa's column 7, lines 21-45. However, Ohsawa's column 7 discusses, "The error E_{ij} stored in the error buffer memory 60 is the difference between a corrected signal X'_{ij} added in the adder 62 ***immediately before the currently processed signal*** and ***the binary digitized output signal y_{ij}.***" Accordingly, as illustrated in Ohsawa's FIG. 6, the error buffer memory 60 indicates error A through L generated in 12 pixels around the currently processed signal. However, Ohsawa's column 7, lines 33-35, clearly discloses that an error stored in the buffer memory 60 is based

upon a difference between a corrected signal added ***immediately before the currently processed signal and the binary digitized output signal*** y_{ij}, so Ohsawa does not perform "***optimizing*** a value of a target pixel to be binarized" in "***suppressing input read errors***," such as providing the claimed present invention's "binarizing unit ***sets a proximity area close to a target pixel***" (e.g., claim 8). Therefore, Ohsawa's error dispersion method differs from the claimed present invention's "***binarizes an input image*** ..., while ***suppressing input read errors*** occurred when said input unit inputs the binary image ***by optimizing a value of a target pixel to be binarized***, and generates a binarized halftone dot image," as recited in claims 1 and 8-15.

Further, in rejecting dependent claim 11, "***detects an inclination in regard of pixel values on the basis of distribution thereof***, the halftone dot image binarizing unit ***does not binarize the target pixel in the absence of change of the value thereof***," the final Office Action in page 13 relies on Ohsawa's column 4, lines 55-66, however, this Ohsawa discussion relates to discrimination between edge area and non-edge area, but differs from the claimed present invention's "***binarizes an input image*** ..., while ***suppressing input read errors*** occurred when said input unit inputs the binary image ***by optimizing a value of a target pixel to be binarized***, and generates a binarized halftone dot image."

DEPENDENT CLAIM 17

In rejecting dependent claim 17, the final Office Action relies on Graham. However, Graham in column 11, line 65 to column 12, line 6, discusses, "Jaggies on vertical lines are removed by looking for changes in the vertical direction of one pixel to the right or left and ***then a one pixel change in the opposite direction***." However, in contrast to Graham's discussion on Jaggy removal, the claimed present invention as recited in dependent claim 17 provides, "wherein said line drawing/character smoothing unit ***sets a mask in the given area*** to count the number of black pixels in each row or column in said mask, and ***shifts the mask to count the number of black pixels only in a new row or column that is not included in the mask before shifting***, so that the jaggy can be detected by the numbers of black pixels before and after the mask is shifted." Graham's discussion of "a one pixel change in the opposite direction" differs from the claimed present invention's, "***shifts the mask to count the number of black pixels only in a new row or column that is not included in the mask before shifting***."

CONCLUSION

In view of the remarks, withdrawal of the rejection of pending claims and allowance of pending claims is respectfully requested.

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Respectfully submitted,
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